Solar Pool Heating Systems

Interestingly, seasonal pool heating is one of the most cost-effective, active solar applications in Vermont. Low-cost, unglazed, pool collectors can heat a pool to 80 degrees Fahrenheit during the summer months and help extend the outdoor pool season.

It is not uncommon for pool owners who heat their pool with an oil or propane boiler to spend over $1,000 a year on fuel bills. A solar system can provide two-thirds or more of this heat, paying for itself in as little as four years.

How Do They Work?

The basic components of a solar pool system are the collectors, controller and diverter valve. The existing pool pump is used to circulate water through the collectors, raising its temperature two to three degrees Fahrenheit before returning it to the pool. Because most of a pool's heat loss is at its surface through evaporation and convection, a pool cover is an excellent way to retain heat gained during the day.

Because solar systems for outdoor pools operate only during warm weather (May through September) the collectors do not have to have a glass cover and insulated box around them to operate efficiently. Most pool collectors are made of black, ultra-violet resistant plastic and are usually 4' x 10' or 4' x 12' in size. A series of collectors, usually six to ten, are joined together to form a large collector "array". The collectors should be mounted to face within 30 degrees of true south (195 degrees magnetic) at an angle of about 30 degrees above horizontal.

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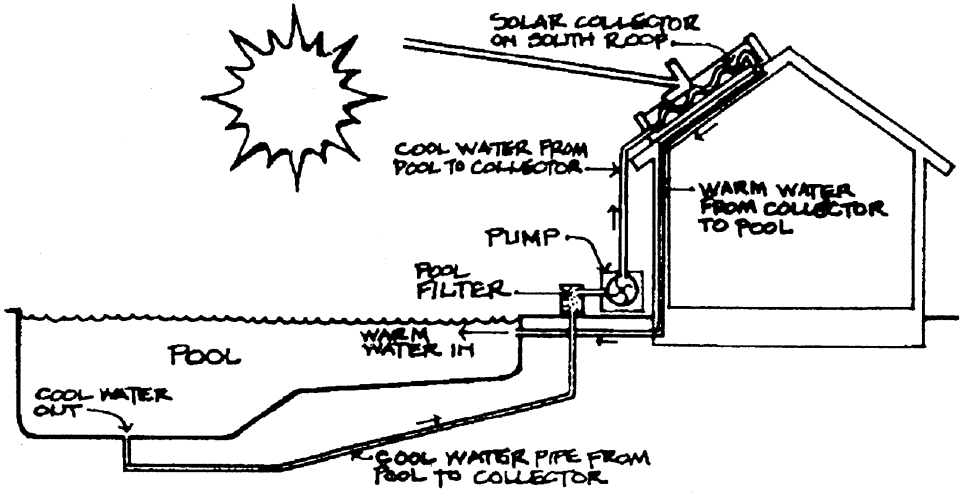
A *differential controller* monitors the temperature of the collectors and the pool water. When collectors are warmer than the



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pool, a controller opens a three-way *diverter valve* that sends the flow of filtered pool water through the collectors and then back to the pool. When the pool reaches the desired temperature or the collectors cool down, the controller closes the diverter valve. The collectors will then gradually drain back into the pool, which helps protect against freezing in early spring or late fall.

Collector Sizing & Placement

The size of a solar pool system depends on the size and location of the pool, the collector orientation, whether an insulating pool cover is used and the desired water temperature. A general rule of thumb is that for south-facing collectors, the collector area should

be one-half the surface area of the pool. Thus a 16' x 36 pool would need six 4' x 12' collectors. If the collectors have to face either east or west, then their area should be three-quarters of the pool surface area.

Collectors are generally mounted on a nearby roof or on a ground rack. Roof mounted collectors should never be mounted directly on top of the shingles. The moisture that can be trapped under the panels will cause damage to both wood and asphalt shingles. A simple rack of pressure-treated wood will allow water to drain under the collectors, protecting the shingles.

The use of an insulating pool cover will cut the heat loss from a pool dramatically. Transparent "solar" pool covers are available that also let the pool absorb the solar radiation that hits its surface. This alone can raise the pool temperature about five degrees Fahrenheit when used 12 hours a day.

How Long Do Systems Last?

Because pool collectors are unglazed and exposed to the elements year-round, a homeowner should be concerned with the expected lifetime of the collectors. With recent advances in plastic manufacturing, today's collectors are expected to last at least 15 to 20 years.

A solar pool system is virtually maintenance free but, just like the pool, needs to be carefully drained in the fall and inspected when reopened in the spring.

All major collector manufacturers include a warranty on their collectors for at least ten years and some offer limited lifetime warranties. Pool owners should read the warranty coverage carefully and talk to the installer about any limitations on coverage.

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Factors To Consider

Here are some important questions to ask yourself when considering the installation of a solar pool system:

- Have you installed a pool cover to help retain heat in the pool and to reduce evaporation?
- Is there a south-facing surface on your roof or beside your pool that is large enough for the collectors?
- Is the collector site unshaded between 9 a.m. and 3 p.m.?
- Is the area fairly close to the pump and filter to minimize pipe runs?
- Are there any aesthetic concerns about mounting collectors?